DOCUMENT RESUME

ED 294 372 EC 202 541

AUTHOR Uhl, Gladys J.
TITLE What Does Problem Solving Contribute to Education for the Gifted? Strategies and Techniques Relating to Attitudes and Behavior.
PUB DATE Jun 84
NOTE 19p.; Paper presented at the International Conference: Education for the Gifted, "Ingenium 2000" (Stellenbosch, Republic of South Africa, June 26-29, 1984).
PUB TYPE Viewpoints (120) -- Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Case Studies; Curriculum Development; Elementary Secondary Education; Foreign Countries; *Foreign Students; *Gifted; *Peer Relationship; *Problem Solving; Program Development; Special Schools; *Talent Identification
IDENTIFIERS *South Africa

ABSTRACT

The American-born and -educated director of an international elementary and secondary school for gifted children in South Africa uses her 40 years of experience to explore the needs of gifted children and the goals of gifted education. The school provided an American-based educational program and English language instruction to a multilingual, multinational, and multiracial student body with IQs from 135 to 197. The director believed that problem solving was the skill most needed in any gifted or nongifted individual's life and placed it at the core of the school's curriculum. Also important to the school's philosophy was the belief that the gifted have a universal need for other gifted peers. She relates an experience with a group of students, ages 7-18, who voluntarily formed an association to enhance their English-speaking skills while attempting to solve "real life problems as a group." Stronger efforts worldwide in identifying and providing an appropriate education for gifted students are advocated. She acknowledges the lack of agreement on how best to accomplish this and cites several examples of successful programs in the United States and one in Bogota, Colombia. Appendices list characteristics and basic educational needs of the gifted and talented. (VW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED294372

WHAT DOES PROBLEM SOLVING CONTRIBUTE TO EDUCATION FOR THE GIFTED?

STRATEGIES AND TECHNIQUES RELATING TO ATTITUDES AND BEHAVIOR

BY

Gladys J. Uhl, Ph.D. Education Consultant
A CONSORTIUM OF EDUCATION SPECIALISTS(ACES)
President Emeritus, Instituto de Educación
Founder: Laboratory School for the Gifted
Colegio Estados Unidos, Bogotá, Col. S.A.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

SUBJECT CATEGORY: Philosophical Foundations

"Neither this paper nor any version close to it has been or is being offered for publication. The paper will be presented orally at the Ingenium 2000 by the author. University of Stellenbosch, Republic of South Africa June 26-29, 1984

Gladys J. Uhl
Gladys J. Uhl
2327 Shannon Dr.
Houston, Tx. 77027
U.S.A.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Gladys J. Uhl

TO THE EDUCATIONAL RESOURCES

A B S T R A C T

Educators and teachers must create an inspiring and realistic climate for learning for educating the gifted and talented. As intellectual and other abilities increase, as well as diversity within and between gifted individuals, real life problems interest and challenge students more than simulated ones. Students need group interaction for reality verification as they address their strengths and weaknesses in developing their potential.

Two examples of problem solving are presented. 1. A Civic Problem involving multinational, multilevel, multilingual, and multiracial gifted students. 2. The Problem of putting a man on the moon. By this process, teachers focus on learning incentives as they develop awareness and strategies to meet the needs of the G/T commensurate with cognitive abilities.

INTRODUCTION

We all agree that leadership input is needed from the more able people if the governments of the world ever hope to mediate their differences and work in collaboration. This is the greatest problem our gifted have to solve.

Professor Cawood has done a monumental study on leadership development, and (1) my paper addresses one of his process objectives in developing gifted student leadership. My purpose is to discuss the value of problem solving for the gifted and talented and to present a workshop in the second half of our session to define and discuss new techniques and strategies developed for the gifted.

Leta Hollingsworth, one of America's pioneers in gifted education at Columbia University had a large part in launching my career of working with the gifted and talented children and youth. When I knew that I would be living in South America with my geologist husband she said, "You have an opportunity that comes to few people with your interest and love of gifted and talented children. Open a school for international gifted children and learn all you are able to about how to educate them."

I took her advice and forty years later, I am still learning about my gifted students and also teachers who are making their own contributions in many countries.

At first it was difficult to find teachers for the gifted and it soon became clear that teachers had to be taught about the nature and needs of the gifted. We also found that parents of the gifted needed more information about their children so the Institute of Education for Teachers and Parents was founded. I want to share with you some of the discoveries in problem solving in which I have been fortunate enough to participate in the adventure of gifted education.

The school was started with some handicaps. There was no homogeneity among the students except the fact that all had approximately 135-197 I.Q.'s on various batteries of tests in their native languages. But there was no common language!

They were multilingual, multinational and multiracial. Our first problem was to find a way to communicate and work with them effectively and quickly before their parents got discouraged and took them out of school.

There was one great advantage. All of them had other gifted children as peers which now is considered a universal need of gifted children (2). There were other commonalities too: all had ambitious parents who wanted them to learn English over night and to have an American education. In retrospect, I am not sure this was of prime importance as their own national educational programs and philosophies had much to contribute. My masters degree had been in International Education at Columbia and this was another facet of my interest.

Of course, the children found nothing wrong about avoiding English and speaking in their own languages several times a second. We had a Tower of Babel until I learned to say in twenty-five languages "please speak more softly". Then a little British boy name Sam came to my rescue. He clenched his teeth together and said in a strong voice that all could hear clearly, "Sh - shut up." From then on he controlled the noise factor and the Tower of Babel fell apart!

The teaching of English as a second language (ESL) was in its infancy. At the University of California, I had taken the first course ever offered heretofore in teaching methods of ESL. It was taught seven hours a day, every day. That was in 1938. The next year all the graduate students who had finished the course had jobs teaching English to aliens in the Oakland, California Evening School to seventy-five students to the classroom. I soon found our students in Bogotá were not impressed by my "methodology" nor were they concerned about learning English as a second language. Most of them already knew two or three languages fluently. But their parents wanted ENGLISH! The students learned to call all teachers Meese and invented many other devices to communicate and to manipulate the faculty. This led me to realize I had a man-sized problem. John Dewey's philosophy came back to me from early student teacher days.."We learn by doing, and all ideas are tools or instruments in the solution of (3)

problems of the environment." Well, we certainly had the environment filled with ideas and there were so many problems that we changed the school's name to "Operation Crisis". Then the children renamed the teachers and we became "Creases" (the Spanish pronunciation of c-r-i-s-i-s). Well, at least, they didn't call us creeps.

Teachers and parents, most of whom spoke English were college graduates and they became my Problem Peers. I let them have the problems and I had the fun. We practically wore out Dewey's philosophy; it was at least threadbare. We did so much, learned so much and survived for 36 years even if we did work 16-24 hours a day! Then the national government decided to take over.

---

1. EDUCATION IS AN ON-GOING THING THAT IS NEVER FINISHED! New truth and knowledge are discovered each generation that have been present since the beginning when the cave man first taught his precocious son to use a club.

   1.1 We discover new ways of looking at old truth in the light of present needs, and we find breakthroughs on which teaching skills are based.

   1.1.1 Problem solving started when prehistoric man began to think.

   1.1.2 Civilization is the story of man's solutions to problems, some of which were successful and some of which were failures.

   1.1.3 To prevent total failure and leave room for a new beginning, some Pleistocene master teacher invented the theory of EVALUATION in problem solving and we have been using it ever since.

2. The skill most needed in any gifted or nongifted individual's life is PROBLEM SOLVING. (How my old dean at the University of Oklahoma would like to hear me say this! We cut our teeth on his Project Method and Problem (3) Solving, and when I went to visit him one day to tell him about the school he cut his class, the first time ever, to talk to me about gifted children.)

   2.1 Most of the emphasis in futures studies is related to problem solving prediction (4) and forecasting. In fact the teaching of future problem solving(5) skills may be the key to successful teaching of basic education, (6) and speed up learning by making a tremendous

improvement in the educative process. (7)

2.2 Problem solving may help the gifted to soar to new heights of creativity (8). Hopefully, logical and ethical thinking will speed up the process of socialization and maturation.

2.3 An examination of the new teaching materials flooding the market convinces me that the emphasis of the instructional program is on problem solving, thinking skills and creativity. In the curriculum, the teaching of Thinking Skills will surely involve and enhance problem solving skills which can be quickly taught and implemented in the teaching of any subject. (9) It is teachable at almost any age from kindergarten through graduate and professional school. It is effective in developing the abilities which seem to be required in solving future problems. (10)

2.4 For teachers and parents problem solving once clearly understood will provide them with stronger skills in working with any child and especially the gifted and talented. The procedure is simple and can be used with any group, any time, anywhere and with no additionally required equipment or cost. The creativity inherent in problem solving is as good for teachers and parents as it is for children and youth.

2.5 It brings about behavorial and attitudinal changes quickly and effectively in the lives of the gifted. Their lives become more satisfying to themselves and others.

2.5.1 Too frequently gifted students have not been challenged to go beyond learned solutions. Research shows that gifted students lag behind average students in the development and enjoyment of team work and interpersonal skills.(11).

2.5.2 It is necessary for the gifted to learn how to work with their equally gifted and less gifted peers. Gifted people are often "loners", sometimes impatient with lesser intellects and unable to communicate constructively with them. (12)

2.5.3 Cooperation and attitudinal perspective are especially important for the gifted as for every other student becaus of the psych-

chological demands of giftedness on the individual. Parents, teachers and even the students themselves have difficulty coping with the loner syndrome, unless its origins are understood.

2.5.4 More research is needed to fully understand the psychological demands that giftedness makes on individuals. The commonly accepted idea is that superior levels of intelligence may produce more pressures and frustations in the behavior of the gifted than in the average student. Research shows this may not be true at all. There are many factors involved. Interdisciplinary studies are revealing new information. (13)

2.5.5 Research reveals that in most cases more gifted children have a higher self-concept than nongifted children. (14)

2.5.6 Some authors suggest that extremely gifted children with ranges over 170 I.Q.'s (15) have social adjustment problems (16) problems that are due largely to their extraordinary mental talents.

2.5.7 An advantage the gifted have is that they have a realistic idea about their capabilities and potentials that stems from a well developed sense of self. They tend to be self evaluators and self-healers. How they feel about themselves is more important than what they know. (17)

2.5. We know the gifted students' universal need is for other gifted peers, and to a large extent in proportion to the degree of their giftedness. Then they, also, need some chronological peers who have approximately similar degrees of "interests" preferably in related fields or areas. There are four reason for this:

For reality verification
For special communicative feedback
To develop their own self image
To learn skills, facts, relationships and application of what they know and have the capacity to learn. (18)

2.5.9 When teachers and parents are cognizant of the needs and characteristics of the gifted and talented it is easier to see how creative problem solving meets these challenges. A study of these then is the first step

in developing techniques and strategies of problem solving for the gifted involving (desirable) attitudinal change. (19) (20) An example of this approach is based on the fact that many students are not motivated to master essential and basic skills unless they see a connection between them and their present lives.

2.5.9.1 Underachievers can be stimulated to become self-motivating when they are engaging in group problem solving of high interest. Usually, it is problem solving of real life problems and not concocted situation exercises. They are able to break out of their shell of self imposed boredom or inattention and almost unconsciously emerge as enthusiastic achievers.

3. PROBLEM SOLVING OF REAL LIFE PROBLEMS PUTS REALITY INTO LEARNING

3.1 In many ways the methodology of creative problem solving as formulated by Osborn and Parnes (21) is ideal for those who are open to new ways of using this age old technique and apply it to teaching the gifted. It is effective in developing the ability which seems to be required (22) in solving nearly all problems in the educational spectrum of the gifted and talented.

3.1.1 The Osborn, Parnes model seems to be the easiest to teach and has been highly successful at the elementary and secondary school level. It is also used in teacher training courses for Olympics of of the Mind. (23)

3.2 WHAT IS THE MODERN APPROACH TO PROBLEM SOLVING?

3.2.1 Edward de Bono, founder of the CORT PROGRAM runs the largest program in the world for the teaching of thinking in the schools.(24) He asked a group of teachers of mathematics to define thinking; they saw it almost exclusively as a process of "problem solving."

3.2.2 Thinking is the operating skill through which intelligence acts upon experience. (25)

3.3 THE REAL VALUE OF FOSTERING PROBLEM SOLVING IN THE EDUCATION OF THE GIFTED IS THAT IT PROVIDES STUDENTS:

3.3.1 The joy of discovery, the desire to learn and the ability to(26) identify and resolve any problem with which they are confronted.

3.3.2 It provides a group experience in critical thinking, creative exploration, analysis, cause and effect relationships, underlying principles of valid generations about events, people or objects in a setting where there is input from all participants under the guidance of a teacher versed in the techniques of problem solving.

3.3.2.1 It employs the psychological laws of learning and satisfaction attends effort as students review their objectives and ideas for coming to conclusions and courses of action. After the implementation, the process of evaluation gives practice in the excise of judgement which is the component most difficult to master.

(27) The academic improvement each participant makes is often unbelieveable and surprisingly effective. It involves social-skills, the development of initiative, self esteem, public and school relations, improvement in all subject areas as all disciplines can be integrated and used in problem solving experiences.

3.4 HOW DO GIFTED AND TALENTED STUDENTS CONCEPTUALIZE PROBLEM SOLVING?

This may be answered by hearing what students say themselves about the experience of problem solving.

3.4.1 The following experience with gifted multilevel, multilingual,(28) multiracial and multinational students age 7-18 years, illustrates a first experience for many in problem solving at school. Their summary in their book of RECORDS and their lists of what they learned prepared for their parents gives insight to their feelings of achievement and concepts on problem solving. It illustrates a panorama of dramatic learning experiences.

It was called by the students a "A TRUE LIFE EXPERIENCE WITH A BANG."

In Latin America when there are problems to solve, the first impulse is to see the head man, the manager, the director, the president or even THE PRESIDENT OF THE REPUBLIC, who attends open office once each month to hear problems people wish to bring to him for solutions.

This time it was a head woman instead of a man. A loud knock was heard on my office door which was answered with "Come in, please."

Two students from grades 2-12 and six students from the English Preparatory Department came crowding into my office. Fortunately my coffee table was a big slab of black labradorite that seated twelve of them and the rest made themselves at home on the sofa and my best cushions after they saw my smile.

"Excuse us for coming without an appointment" the older students offered experimentally.

"We have a problem, meese" their fifth grade spokesman said.

"This is strange" I said. "How could so many of you have a problem?"

"Well, meese, we want to be important and do something now. We no want to wait to be perfect." "We don't speak good.... I mean 'well'."

"And what suggestions do you have?"

It was evident they had planned very carefully and already had a representative student organization.

"We want to have a Poor-English-Speaking Student Council and be like the other students who are important in the school."

"What would you like to do if you were members of a P-E-S (for short) Student Council?" I asked.

Almost in unison, "Oh, we would look for reel life shaking probleems to work."

The tenth grade scholar of the English Preparatory Deptartment corrected the rest and spoke clearly. "They mean to say that they would look for real life problems to solve as a group."

"You must make A's in English." I commented.

About that time we all heard a lady speaking in French in the hall. She was calling loudly for "le docteur." We opened the door, and there was an angry, frustrated and beautiful lady. Her yellow Christian Dior elegant suit was covered in black oil! She held a dainty slipper in her hand as the tears began to roll down her face.

A fourth grade boy, already advanced in French, went over to talk to her and found that she had fallen on an oil soaked sidewalk near the school. A bad tempered filling station owner used the sidewalk for oil drum storage.

So without formal charter, bylaws, officers, and a faculty sponsor, the P E S Student Council had a real life problem to solve at their request.

* * * * * * *

Six weeks later they wrote the following summary in their PES Student Council Journal. The now properly elected president gave each a membership pin with their name, year and school initials and PES STUDENT COUNCIL embossed on it. The leather-bound journal book and the pins had been financed with an idea the second grader had: fruit sales at recess time (instead of candy).

No. 16 MINUTES OF THE PES STUDENT COUNCIL March 4,1972

This is a summary of our Problem No. One which we finished solving yesterday.

We voted to change our name now that we know very good English. We will become ENGLISH PREPARATORY STUDENT COUNCIL FROM COLEGIO ESTADOS UNIDOS. EPSC will be our "acronym. "

When we initiated our PROBLEM to get a new sidewalk so people would not fall and ivariably dirty their clothes or get hurt, everyone said, "That is silly. Who is going to pay for it, not that old ogre who owns the filling station."

OUR PARENTS SAID, "This is not practical. You will lose the year doing somethat is none of your business. You need to study instead."

OUR TEACHER SAID, " This is some more of those absurd modern ideas of education from the United States." (The americans didn't say it.)

OUR DIRECTOR SAID, " IF YOU REALLY WANT TO SEE WHAT YOU CAN ACCOMPLISH, all of you have my blessing. Remember to keep up your homework and all except the weekly meeting will have to be scheduled before or after school hours. You must have a faculty sponsor. Good luck! Give me progress reports now and then."

THE OTHER STUDENT COUNCIL MEMBERS SAID, "Oh, you just want to show off."

NOW, EVERYBODY THINKS WE ARE REAL SMART. We are only a little smart, we think.

For a while we were very scared, but we found a nice Colombian teacher as our Sponsor. José, a senior, said we could make a petition to the mayor if we had 500 names. So we wrote the petition (we looked up in a book the words to use) and Alejandro type it. Then we divided the pages ~~between us~~ among us and got 607 signatures from aroundthe school neighborhood. It was fun calling on the people who all signed our Petition to the Mayor. Some invited us to have Tea.

Then we wrote a letter to the Alcalde (Mayor) and waited for an answer. We sent him a picture of Madame Le Fevre's suit and her broken shoe. We sketched the sidewalk with its greasy oil drums. We quoted a "city ordinance" that said it was illegal to use the sidewalk in such a way as to create a hazard. We sent our picture.

WE SOLVED THE PROBLEM. We got a new sidewalk for the neighborhood, and Pierre's Mother was paid for her suit and shoes. This made her happy again. The Mayor invited us to his office and gave us a key to the city, ICE CREAM AND A LARGE CAKE with our school's name on it. The bus took us and waited for us while we were guests of the Mayor. He framed our picture and hung it on the wall.

We kept up our school work and Liza inspected and corrected our homework every morning before school.We made A's in all our subjects. Imagine! ??

We learned a new word in English, "Evaluation." It means you find out what is good and bad about something and how to improve it.

Evaluation of the Problem No. One: Everything we did was fun except reading and memorizing part of Roberts'Rules of Order which we HATED. But we learned how to speak and make our meetings quiet without scream and all talking at once. We made a list of what we learned to give our parents. We moved to adjourn. Liza seconded the motion and made the following corrects so the Minutes stand.

1. typed for "type"
2. invariably for "ivariably"
3. Robert's not Roberts'
4. Respectfully not Respectable.
5. correction not "corrects"

Respectable submitted:
28 signatures
(We all signed in cursive writing because printing signatures is not legal)

P.S. Problem No. 2(we decided and voted)will be collecting books and clothes for poor children. We are asking everyone to be careful with the textbooks and donate them to our Problem when school is out.

LISTS OF WHAT WE LEARNED FOR OUR PARENTS

We learned to hurry and do our school assignments so we could do interesting things like: talk to each other and people who knew more than we know. We learned about human nature. We learned to conduct meetings, write letters and make telephone calls for information we need. We learned from 600-1200 new words in English and how to spell most of them. We improved our French. We learned how to make balance sheets and write "Minutes" (almost). We improved our writing. Some of us taught ourselves to type. We learned jokes.

3.4.2 This example of problem solving demonstrates academic, attitudinal and behavorial growth. All students in the school benefited. Teachers were glad the library had a copy of Robert's Rules of Order ! They practiced their native languages, sometimes several times a second.They experienced the thrill of achievement and recognition. They learned to cooperate!

3.5 In my city of Houston, in both private and public schools, leaders in G/T Education are involving as many people and institutions as possible.

3.5.1 CONSTITUENTS WHO ARE SHARING AND CONTRIBUTING SERVICES ARE:

Administrative staffs	Colleges, universities and schools
Civic leaders	The Community in General
Curriculum experts	Industry, commerce and professions
Parents	Libraries
Psychologists	Museums
Researchers	Organizations, cultural and service
Students	Organizations, minority groups
Teachers	Research institutions
Volunteers	Theaters
Writers	The Media

3.5.2 Houston, like other great cities in the world has many problems.

3.5.3 Every day more immigrants from Mexico, Central America, and Vietnam arrive bringing with them their attendant problems, which become ours.

3.5.4 Minorities and immigrants also bring contributions. The outstanding student in Houston Public Schools in 1984 is a highly G/T minority member. In a New York University, their valedictorian was" from the boat people escaping Vietnan."

4. THE DRAMATIC CHANGES NOW TAKING PLACE AND THE IMPACT OF AN UNCERTAIN FUTURE CALLS FOR A RE EVALUATION OF THE WORLD'S PRIORITIES, ESPECIALLY IN EDUCATION.

4.1 It is estimated that there are at least 200 million and could be far more (28) G/T people of school age on our planet who have not yet been identified.. Needless to say, that most of them have not had appropriate edcation. There lies a potential pool of <u>future international leaders.</u>

4.2 The potential resources, and the technology exists. Then what is holding us back? Socio-economic and geo-political conditions, yes? Lack of distribution and development of natural resources and leadership.

4.3 Is educating our world's gifted any greater challenge to problem solving than putting a man on the moon? It has been calculated that it would cost far less. It is a model par excellence to think about. Educating 200 million G/T potential leaders could change the history of the world.

5. AT PRESENT A GREAT DEAL MORE ATTENTION IS BEING GIVEN TO APPROPRIATE EDUCATION FOR THE G/T: It is a problem of "curriculum solving."

5.1 We cannot agree on how best to educate the gifted, nor when or wher

5.2 We are in a maze of theories with as many philosophies as leaders on how to put meaning and continuity together when students get a bit of this and that, here and there in "enrichment" "pull out" "after school""Saturday" or summer programs. All of which are designed to solve the problem of educating the gifted! Of course, we have good alternatives, but no one agrees on them or else we cannot seem to finance them. Full time schools for the gifted have been successful since the Astor Program was worked out in N.Y. by Virginia Ehrlich (29) and Colegio Estados Unidos founded in Bogotá in 1941. (30) The work of Julian Stanley at Johns Hopkins University stands without parellel in the teaching of math to gifted students. Out of the research of Stanley and others, the programs of "Aceleration" have produced well documented results. (31)

5.3 Educating the gifted is not a new concern in education. It is old as mankind itself. The gifted primitive leaders discovered fire, speech, found food, learned to plant crops and eventually emerged as carriers of the culture and builders of civilization.

5.4 In most cultures the bright individuals were treasured and trained for leadership. But egalitarian doctrines influenced goverrment schools in democratic countries to educate all children equally.

5.3.1 Little, if any, provision was made for the fact that all students do not learn at the same rate, have the same biological, genetic, or environmental advantages; nor parents with the same parenting skills now that we have discovered in G/T education that parents are important again!

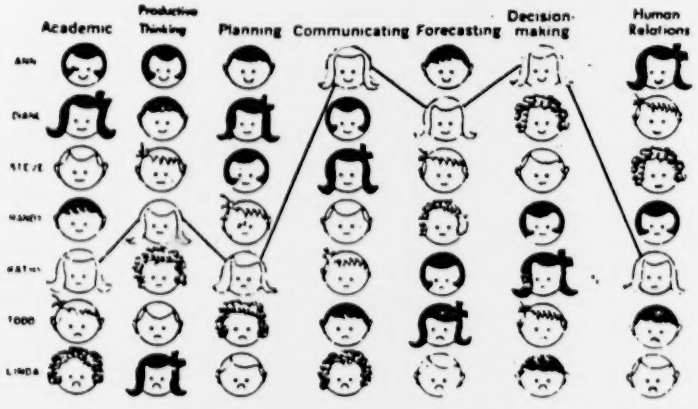
5.5 In the United States, it took us 150 years to discover we had a real problem to solve in educating our gifted students.

5.51 Wise and persistent educators have rekindled the flame of gifted

education many times since 1925 when Terman started his series of studies that eventually invoved 1,528 gifted 10-11 year olds (32) and Leta S. Hollingsworth a few years later tested and screened gifted children to find those of 180 I.Q. and above. (33) In those years only one percent of the student population was thought to be gifted. Now, no one really knows what percentages of gifted are around! There is some interesting speculation going on. The conservative estimate is that between 3 and 5 percent of the school population is gifted. Some researchers have placed the figure as high as 25 percent. Then Calvin Taylor maintains through sustained research that almost all students are gifted in one way or another. (35) He says it is the teachers' responsibilities to discover in which ways their students are gifted. Mary Meeker and Joy Guilford present a whole new approach to giftedness. (36) In their testing and research center called the Structure of the Intellect they have developed a new kind of intelligence test without scores. Theses tests measure 159 traits of giftedness (the last time I heard). I have used these tests with a great deal of delight. And still more when I had parent follow-up conferences!

TAYLOR'S TALENT TOTEM POLES

WHERE DO YOU RATE ON THE TOTEM POLES?



ALL STUDENTS ARE NOW EDUCATIONALLY DEPRIVED

The Multiple Talent Approach to Teaching has emerged from sustained research on talents. A breakthrough of teaching for creativity breaks away from the narrow band of academic-and-intelligence talents and expands into teaching for several other high level talents, heretofore largely ignored and left dormant in typical classrooms. Intelligence tests, encompassing about eight talents (less than one-tenth of the 98 talents now known), miss more than nine-tenths of the important intellectual talents now measurable. Consequently, the main goal in Multiple Talent Teaching is to have students use many more of these neglected talents than they do at present. (See Taylor's Talent Totem Trees above.) * 150(1983)

II. CONCLUSION

Teachers and educators may never solve the world's crises. But when problems are solved there is a mighty force that moves people to these achievements. Teachers and educators have long ago lost their quest for power if it ever existed. We are people who have the insight to understand that there are tasks and almost impossible barriers to hurdle, and we are dedicated to the work at hand. We do not want fame or much credit for our part in the work of the world; we just want to see it done and done well. That is our reward.

Solutions are never easy but input from our great minds and energy from our well educated leaders will improve our chances of existence. Education may not solve the world's tremendous problems nor any of its theories; maybe our one hope will be in the kinds of people we as teachers have a part in educating.

LIKE CAPTURED FIREFLIES

In her classroom our speculations ranged the world.
She aroused us to book-waving discussions,
Every morning we came to her carrying new truths, new facts, new ideas
Cupped and sheltered in our hands like captured fireflies
When she went away a sadness came over us,
But the light did not go out.
She left her signature upon us
The literature of the teacher who writes on children's minds.
I've had many teachers who taught us soon forgotten things,
But only a few like her who created in me a new thing, a new attitude,
A new hunger. I suppose that to a large extent I am the unsigned
Manuscript of that teacher.
WHAT DEATHLESS POWER LIES IN THE HANDS OF SUCH A PERSON.

John Steinbeck Oct. 1957

APPENDIX I

THE PERPLEXITIES FACED WITH INCORPORATING PROBLEM SOLVING IN THE CURRICULUM ARE BETTER UNDERSTOOD BY A STUDY AND CONCEPTUALIZATION OF:

1. Characteristics of the G/T 2. Basic Needs of G/T Children and Youth

(Experience in working with the G/T will enable the teacher to make a study of characteristics and needs of children and youth in the local area)

5. CHARACTERISTICS OF THE GIFTED/TALENTED

They have:

- Abounding energy
- Extraordinary curiosity
- Long interest span and power of concentration
- A well developed sense of self
- Powers of abstraction, conceptualization and synthesizing
- Serious attitudes, which may be frustrated by silliness and mediocrity
- Good memories and can pick out non verbal clues
- Large vocabularies and read widely and quickly
- Sensitivity to beauty and enjoy creative arts
- Sometimes imaginery friends

They learn:

- To read earlier than other children; often by age four or five
- Basic skills better, more quickly and with less practice and drill and need little rep tition in the learning process
- To respond well to others, especially gifted peer and parents
- To take pleasure in intellectual activity
- To readily perceive similarities, differences and anomalies
- To seek information for the sake of having it as much as for its instrumental value
- To spot inconsistencies and are often skeptical, critical and evaluative

They are:

- Often rapid talkers, thinkers and problem solvers
- Fluent and flexible
- Able to see relationships among unrelated objects
- Day dreamers at times, especially if bored
- Less inhibited than their peers in expressing opinions and ideas and often have disagreements with peers, teacher and family.
- Frequently larger and healthier than other children of their age
- Independent workers

They are attracted to: logical thinking, order and consistency
(this does not mean they keep their rooms in absolute order)
Complexity and seem to thrive on problem situatons
To fairy tales, science fiction, adventure and "make believe"
Beauty in all its forms which may take a special place in their lives such as music, art, performing arts, dance
Television, yes! (But some gifted children prefer to read or work with hands)

5.1 It should be said again that not all children have all these characteristics but that frequently gifted children have some or most of them. The teacher's own list of the group is more interesting and valid for observation and study.

2. Professor Feldhusen's list of basic needs for the gifted and talented enumerates eleven essentials, all realized through skillful use of the problem solving techniques and strategies in educating the gifted.

LIST OF BASIC NEEDS FOR GIFTED AND TALENTED CHILDREN AND YOUTH

2.1 Maximum achievement of basic skills and concepts

2.2 Learning activities at appropriate level and pace

2.3 Experiences in creative thinking and problem solving

2.4 Develop convergent abilities, especially in logical deduction and problem solving.

2.5 Stimulation of imagery, imagination, spatial abilities

2.6 Stimulation to pursue higher levels, goals and aspiration. Models and standards

2.7 Development of self-awareness and acceptance of own capacities, interests and needs

2.8 Development of independence, self-direction and discipline in learning

2.9 Experience in relating intellectually, artfully and effectively with other gifted and talented students.

2.10 A large fund of information about a variety of fields of study: arts, professions and occupations

2.11 Access and stimulation to reading